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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,983	10/21/2004	Yasuko Hayashi	047991-5014	7193
9629	7590	05/22/2006	EXAMINER	
MORGAN LEWIS & BOCKIUS LLP 1111 PENNSYLVANIA AVENUE NW WASHINGTON, DC 20004			ZETTL, MARY E	
			ART UNIT	PAPER NUMBER
			2875	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/511,983	HAYASHI ET AL.	
	Examiner	Art Unit	
	Mary Zettl	2875	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/21/2004</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The abstract of the disclosure is objected to because it is believed that in the first sentence "A platy" is a typographical error. The abstract is further objected to because numbers corresponding to components in the Figures should not be included.

Correction is required. See MPEP § 608.01(b).

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the angle alpha and the existence proportion of angle components in the vicinity of the primary light source referred to in claims 4 and 20 must be shown or the feature(s) canceled from the claim(s). In regards to claim 20, it is further suggested that a drawing be added showing an example of a profile claimed for the first region and the profile claimed for

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the second region. Furthermore the "inclination angle" on the "anisotropic rough surface" claimed in claims 26-29 must be shown or the feature(s) canceled from the claim(s). It is unclear how angles are being measured on an "anisotropic rough surface." No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. Figures 27-33 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claims 1 and 41 are objected to because of the following informalities: it is unclear what is being referred to in line 18 by the phrase "elongated concave/convex structure forming surface is 10% or more" and moreover 10% or more of what. Furthermore even though it is referred to in the specification what is meant by the phrase "existence proportion of angle components" is still unclear. In the examination of the application, prior art has been found based upon what is presented in the Figures.
6. Claims 4 and 20 are objected to because of the following informalities: the claim language is vague and indefinite. The examiner has inferred that the claim is pointing to a specific shape of the light guide surface and the examiner has cited prior art based on what appears to be illustrated in the Figures.
7. Claim 13 is objected to due to the reasons specified with respect to claims 1 and 41, with respect to the new numbers presented in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 16, 17, 30-32, 39, 41-45, and 48 are rejected under 35 U.S.C. 102(b) as being anticipated by Tai (US 5,854,872 A).

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Regarding claims 1, 4, 30, 31 Tai discloses a light guide (Figure 1, item 30) for a surface light source device (Abstract), having a plate-like shape, which guides light emitted from a point primary light source (Figure 1, items 2 and 4) and which has a light incident end surface (Figure 1, item 10) and a light outputting surface (Figure 1, item 40), wherein a plurality of elongated concave convex (a modification described in col. 7, lines 64-67) structures (Figure 8, item 74) extending substantially along a direction of directivity of the light which has entered the light guide in a plane along the light outputting surface and formed on the following one side of the light outputting surface (Figure 1, item 40) and a back surface on an opposite side (Figure 1, item 32), and at least in the vicinity of the primary light source (Figure 1, item 6). Wherein a shape of the plurality of elongated concave/convex structures in a plane perpendicular to extending direction thereof is any suitable curvature or angular configuration (col. 8, lines 19-22) and the convex/concave structures have angle components of 20 degrees or more and 50 or less (Figure 13, item 13).

Regarding claim 2, Tai further discloses each elongated concave/convex structure is an elongated lens (Note: components not specifically labeled as lens, but fit the definition as transparent optical components that serve to converge or diverge transmitted rays; col. 4, lines 39-43), and the plurality of elongated concave/convex structures are constituted of a plurality of repeatedly arranged elongated lenses having substantially the same shape (figure 1).

Regarding claim 16, Tai further discloses the sectional shape of all or part of the elongated convex structure is constituted of a curved line having an outward convex

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region and an outward concave region (Figure 8, item 74; when the sectional shape is taken to include a valley and a peak).

Regarding claim 17, Tai further discloses the sectional shape being polygonal (Figure 17).

Regarding claim 32, Tai further discloses the average inclination angle of the plurality of elongated lenses is 0.2 to 20 degrees in the direction of the directivity of the light, which has entered the light guide (Figure 2, example 10 degrees and 7 degrees).

Regarding claim 34, Tai further discloses the light outputting functional structure comprising a component (film, item 24; col. 4, lines 49-52) in the light guide, whose refractive index is different from that of a main component of the light guide inside.

Regarding claims 39 and 41, Tai discloses a plurality of obliquely elongated lenses extending in an oblique direction with respect to the direction of the directivity of the light which has entered the light guide being formed in the vicinity of an edge in which the light incident end surface is formed in the light outputting surface or the back surface (Figure 2). And further wherein a shape of the plurality of elongated concave/convex structures in a plane perpendicular to extending direction thereof is any suitable curvature or angular configuration (col. 8, lines 19-22) and the convex/concave structures have angle components of 20 degrees or more and 50 or less (Figure 13, item 13).

Regarding claim 42, Tai further discloses the primary light source (Figure 15, item 92) disposed adjacent to the light incident end surface of the light guide; and at least one light deflection element disposed adjacent to a light outputting surface (Figure

15, item 16) of the light guide (Figure 15, item 156), the light deflection element having a light entrance surface positioned facing the light outputting surface of the light guide, and a light exit surface on the opposite side, and comprising a plurality of elongated lenses extending in a direction substantially parallel to an incident end edge on which the light incident end surface of the light guide is formed and extending in parallel to an incident end edge on which the light incident end surface of the light guide is formed and extending in parallel to one another on the light entrance surface of the light deflection element adjacent to the light guide (col. 1, lines 13-40).

Regarding claim 43, Tai further discloses the plurality of elongated lenses of the light entrance surface of the light deflection element comprising two surfaces, and totally reflecting the light which has been incident on one of the surfaces by the other surface (col. 11, lines 2-11).

Regarding claim 44, Tai further discloses a light reflection element disposed facing the back surface of the light guide (col. 10, lines 65-66).

Regarding claim 45, Tai further discloses the light incident end surface (Figure 1; item 10) being formed in one end edge of the light guide.

Regarding claim 48, Tai further teaches LEDs (Figure 1, items 2 and 4) arranged at an interval, however does not specify a measure of the normal luminance produced. At the time the invention was made, it would have been obvious to one of ordinary skill in the art that utilizing a light guide with the same shape characteristics (discussed previously) and the same materials (col. 11, lines 41) as what are being claimed that it would be within the ability of one of ordinary skill in the art to have utilized

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the same LED source which would have produced the same luminance properties as those being claimed. It would have been further obvious to one of ordinary skill in the art that the light sources would have been spaced such that luminance was in the range being claimed such that the light guide was effectively illuminated but at the same time only the amount of light sources needed were utilized such that cost savings were realized.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 35-38, 40, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tai (US 5,854,872 A).

Regarding claims 35-38, Tai does not disclose expressly the light spread angle however appears to illustrate light being spread in angles encompassing the claimed ranges (Figures 10, 13, 14A, and 14B). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to have created a light guide plate, which had a high degree of light spread in order to maximize the range area that could be covered by the illumination of the light source.

Regarding claim 40, Tai further teaches obliquely elongated lenses extending in a direction and inclined at an angle (Figure 2), however does not disclose expressly this angle being half of the necessary light spread. It would have been obvious to one of ordinary skill in the art that although not specifically stated the lenses would have been inclined at an angle half of the necessary light spread since the other half of the necessary light spread would have been covered by the reflections off of the surface.

Regarding claim 46, Tai further teaches an end edge of the light guide with angle components illustrated by what the examiner infers that the inventor is indicating in the claim. Due to these angle components and the light scattering effect that they cause it would be obvious to one of ordinary skill in the art that the light coming from the primary light sources would be superimposed on each other.

9. Claims 5-15, 18-20, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tai (US 5,854,872 A) in view of Shingo (JP 11052380 A).

Regarding claims 5-7 Tai teaches any combination of concave/convex structures (col. 8, lines 19-22) however does not disclose expressly a region A and a region B in which the existence proportion of angle components of 30 degrees or more and 50 degrees or less in the absolute value of the inclination angle in region B is smaller than that in region A. Shingo teaches the existence proportion of angle components of 30 degrees or more and 50 degrees or less in the absolute value of the inclination angle in region B is smaller than that in region A (Abstract: SOLUTION). At the time the invention was made, it would have been obvious to have modified the invention of Tai

such that concave/convex structures changed from region A to region B as taught by Shingo such that quality of output light was improved.

Regarding claim 8, Shingo further teaches the shape of the elongated concave/convex structures formed in region B gradually changing depending on a position (Abstract: SOLUTION). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the invention of Tai such that the shape of the elongated concave/convex structures formed in region B gradually changed depending on a position as suggested by Shingo such that brightness unevenness was prevented.

Regarding claim 9, Shingo further teaches region B being formed in a part of all of an end portion of an effective light emitting region in the vicinity of the primary light source (Figure 10).

Regarding claims 10 and 20, Shingo teaches a region A and then multiple other regions. The application being examined does not specify that within region B the lens profiles are uniform and thus the Shingo reference teaches a region A and then a region B made up of multiple sub regions covering the rest of the surface (Figure 1 and Figure 10). It would have been further obvious to one of ordinary skill in the art to have made simply two regions A and B such that the regions satisfied the desired light output properties and at the same time simplified the manufacturing process since only two different regions needed to be created.

Regarding claim 11, Shingo further teach a region B being formed in a band shape (Figure 1). At the time the invention was made, it would have been obvious to

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one of ordinary skill in the art to have modified the invention of Tai such that a region B was formed and such that the region B was formed in a band shape in order to have simplified the manufacturing process.

Regarding claim 12, Shingo also teach a region B being formed in an island shape (Figure 1). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the invention of Tai such that a region B was formed in an island shape so that the desired light output characteristics were created.

Regarding claims 13, 14, and 18 Shingo further illustrates (Figure 1) the elongated structures as understood by the examiner as what to what is being claimed. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the invention of Tai such that the changing shape taught by Shingo was implemented in order to have prevented brightness unevenness.

Regarding claim 15, Shingo further illustrate the sectional shape constituting an outwardly concave curved line (corresponding to the valley section of the curve; Figure 1).

Regarding claim 19, Tai teaches different embodiments including ones with curved line sectional shape (Figure 15) and a polygonal sectional shape (Figure 17), however does not disclose expressly incorporating these different regions into one embodiment. Shingo teaches incorporating different sectional profiles, however does not disclose a sectional profile of a polygonal shape. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the

invention of Tai such that two different regions, as suggested by Shingo, were formed including a first region consisted of structures having a curved line shape and a second region consisted of structures having a polygonal shape. One would have been motivated to make this modification since it was known in the art that incorporating different regions mitigates the effects of brightness unevenness and that certain shapes such as polygons effect the light in desirable ways.

Regarding claim 47, Tai does not disclose expressly a plurality of primary light sources being arranged such that the average inclination angle of a light outputting functional structure of the light guide in a region of the front surface of the primary light source is different from that in a region between the primary light sources. Shingo teaches the average inclination angle of a light outputting functional structure of the light guide in a region of the front surface of the primary light source is different from that in a region between the primary light sources (Figure 1). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the invention of Tai such that the average inclination angle of a light outputting functional structure of the light guide in a region of the front surface of the primary light source was different from that in a region between the primary light sources in order to have prevent brightness unevenness.

10. Claims 22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tai (US 5,854,872 A) in view of Yoshiki (JP 2002-46159A).

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Regarding claim 22, Tai does not disclose expressly a transfer surface of the mold being polished. Yoshiki teaches a transfer surface of the mold being polished (paragraphs 26). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the invention of Tai such that a transfer surface of the mold was polished as suggested by Yoshiki such that a surface capable of producing the desired light output qualities was produced.

Regarding claim 25, Tai does not disclose expressly forming a surface by blasting a part or all of the surface of a formed material or obtaining a second mold by transferring a first structure shape. Yoshiki teaches blasting a part or all of the surface of a formed material or obtaining a second mold by transferring a first structure shape. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the invention of Tai such that the forming processes taught by Yoshiki were utilized since it was well known that these processes were relatively simple and conventional manufacturing processes that were effective in producing surfaces intended to effect the light in specific ways.

11. Claims 26-29 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tai (US 5,854,872 A) in view of Ono et al. (US 6,607,281 B2).

Regarding claims 26-29 and 33 Tai does not disclose expressly a roughed surface on the concave/convex structures of the light incident end surface. Ono et al. teach a light guide plate (Abstract) including an anisotropic roughed light incident end surface (col. 9, lines 43-51). Ono et al. do not disclose expressly exact angles of the

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roughened surface however it would have been obvious that a grinding process, such as that described by Ono et al. would have produced small angles (under 30 degrees). Ono et al. also do not specify surfaces other than the light incident end surfaces being roughened, however it would have been obvious to one of ordinary skill in the art to have roughened other surfaces in order to have enhanced the light scattering effect. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the invention of Tai such that the light incident end surface was an anisotropic roughed surface, which would have improved the light scattering effect.

12. Claims 3, 21, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tai (US 5,854,872 A) in view of Ida et al. (US 6,799,859 B1).

Regarding claim 3, Tai does not disclose expressly a part or all of the surface of each of the elongated concave/convex structures being roughened. Ida et al. teaches a light guide (Abstract) comprising roughened surfaces (col. 5, lines 47-59). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the invention of Tai, such that a part or all of the surfaces of each elongated concave/convex structure are roughened as suggested by Ida et al. such that the light scattering effect was enhanced.

Regarding claims 21 and 24, Tai teaches the use of transparent mold for forming the convex/concave structures (col. 11, line 36-40), however does not disclose expressly the transfer surface of a mold being blasted. Ida et al. teach the use of the blast method (col. 5, line 59). At the time the invention was made it would have been

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obvious to one of ordinary skill in the art to have modified the invention of Tai such that the blast method as taught by Ida et al. was utilized such that a roughened surface was formed and the light scattering effect was enhanced.

Regarding claim 23, Tai teaches the use of transparent mold for forming the convex/concave structures (col. 11, line 36-40), however does not disclose expressly the use of etching. Ida et al. teach the use of the etching method. AT the time the invention was made it would have been obvious to one of ordinary skill in the art to have modified the invention such that etching was utilized as suggested by Ida since it was an efficient and conventional method for processing light guides.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Gardner et al. (US 5,001,609 A) teach a light source in which the lens surface is roughed in order to enhance the light scattering effect (col. 8, lines 51-54).
- b. Arai et al. (US 6,384,881 B1) teach a light guide plate (Figure 1A) including surfaces with various concave/convex structures (Figures 1B and 1C).
- c. Egawa et al. (US 2002/0006036 A1) teach a light guide plate (Figure 1) consisting of a surface (Figure 2) comprising concave/convex structures formed in order to increase the illumination efficiency (Abstract).

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary Zettl whose telephone number is (571) 272-6007.

The examiner can normally be reached on M-F 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Renee Luebke can be reached on (571) 272-2009. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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RENEE LUEBKE
PRIMARY EXAMINER